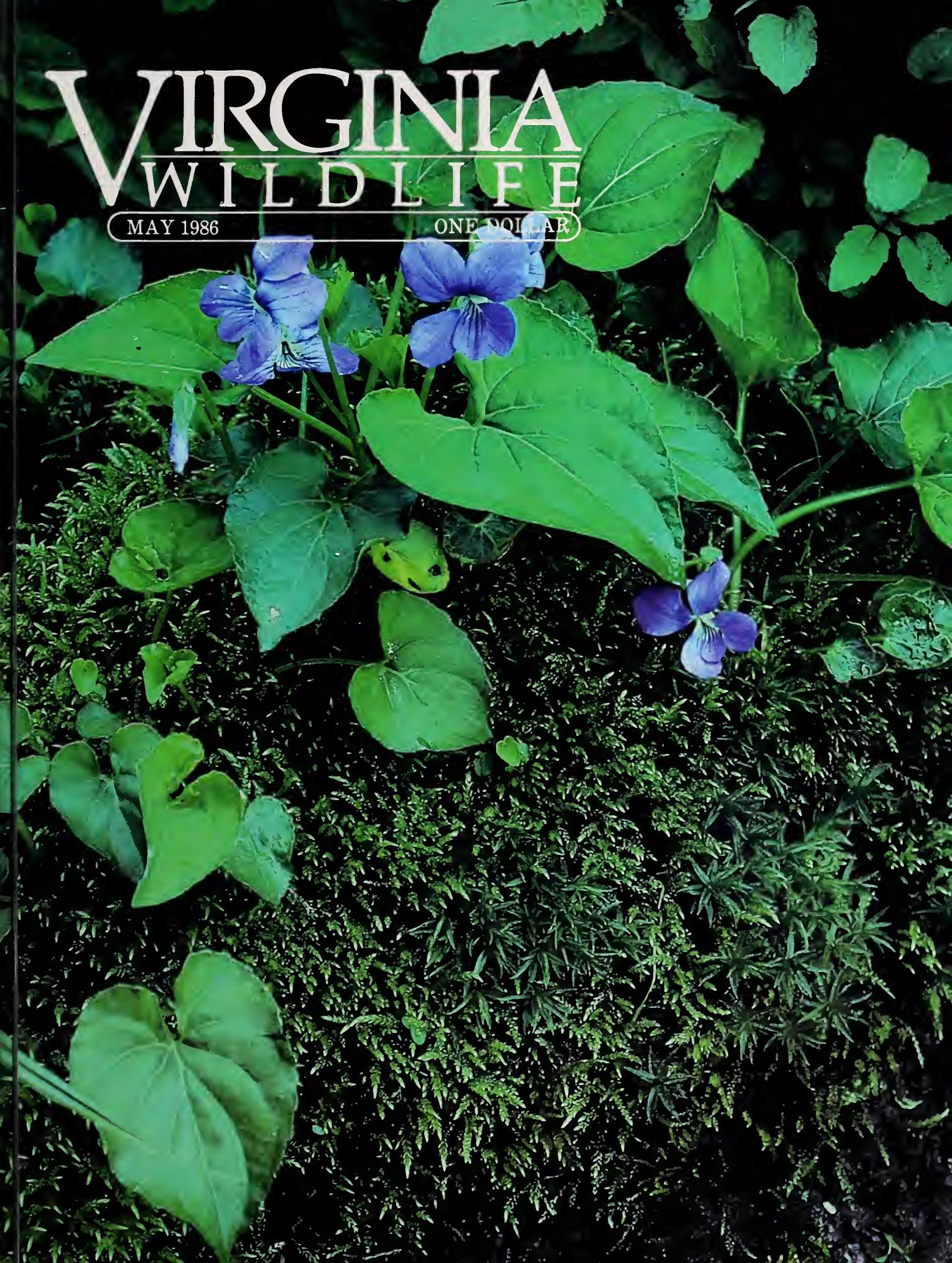


# VIRGINIA WILDLIFE

MAY 1986

ONE DOLLAR



*"To allow mystery, which is to say to yourself, 'There could be more, there could be things we don't understand,' is not to damn knowledge. It is to take a wider view. It is to permit yourself an extraordinary freedom: someone else does not have to be wrong in order that you may be right."*

Barry Lopez, *Of Wolves and Men*

It was a hunt. A snake, lizard, turtle, and toad hunt to be exact, that altered my perspective. A friend of mine who happens to be a fine herpetologist and an unparalleled snake hunter, allowed me to tag along with him on a collection trip for his research with the Game Commission.

We snuck up on 'em. We crouched and ran at 'em. Chris caught the slightest movement. He could spot a fence lizard sunning on a limb at 50 yards—and he could catch 'em. It got to be unnerving. Chris could find them everywhere those critters wanted to be, and everywhere I didn't want to be. Like under a nasty, decayed stump with grubs and beetles stuck to it.

Once, while we were dropping a fence lizard into a bag, the blue streaks on his belly flashing at us, Chris smiled. "Hey, did you ever think of what the world looks like to a lizard? Can you imagine something 40 times bigger than you are grabbing you while you're out sunning on a log? Or, think of what a single rock looks like to a skink or a salamander?"

That triggered something. I'd been thinking a lot lately about the nasty dispute going on between conservation groups and the Forest Service about how to manage our forests. A lot of magazines are devoting whole issues to the topic, and most of the time, the Forest Service comes out battered. I was puzzled, like I always am with "good guys vs. bad guys" issues. I know what I feel like looking at those incredible photographs of moss-strewn 200-year-old fir trees and wildflowers and hidden streams captured so timelessly in the slick magazines. I know that if I had been in that forest when those pictures were taken, and someone had come traipsing up with a chain saw and a lumber truck, I would have done my best to whack him over the head with the nearest log, hoping to do severe damage.

But, I wondered what perspective that mud salamander Chris grabbed by the tip of its tail might have. Heck, he might not think logging was such a bad idea if it created an open area to hatch a few more insects in, provided there was enough old growth left that he could move into, and a dead log to burrow under, and enough space to find a mate in.

It's hard to admit that there might be another way of looking at things. Jack Raybourne, our Game Division Chief, is fond of telling of his first encounter with clearcuts. He hated them. Hated the barren, ugly wastes of stripped land. And he was determined to prove that turkeys hated 'em too. But, driving up to his research site one day, he was stunned. The turkeys had the *audacity* to use that area. And not only that, *they nested in it*. Proved that you can't trust any animal to behave the way you think they should. And perhaps that's the key. And that's why we can't afford to take sides based on our human perception of "good" and "bad" habitats. If we do, some ecosystem is going to suffer.

Chris and I headed down into some swampy area. I fell into some red muck trying to learn how to use a dip net properly. Darned tadpoles and mud turtles. They ought to be in a nice cypress swamp somewhere, instead of this muck. But they aren't. Instead, I've got to live with clearcuts and nasty ponds, 'cause *they like 'em*.

I still love old growth. But forest management decisions, it seems to me, should not be reduced to a choice between a monoculture of 250-year-old forests or one of 20-year-old saplings and honeysuckle. Instead, we need a synthesis of perspectives, from the needs of that nasty looking beetle I refused to pick up, to the wild turkey I hunted this spring. And, perhaps in the final analysis we'll agree with Chris, who maintains that "We need it all." This is the wider view.

Commonwealth of Virginia  
Gerald L. Baliles, Governor  
Commission of Game and  
Inland Fisheries

Dedicated to the Conservation of Virginia's Wildlife and Related Natural Resources  
Volume 46, Number 5  
May 1986

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*Virginia Wildlife* (ISSN 0042 6792) is published monthly by the Education Division of the Virginia Commission of Game and Inland Fisheries, Box 11104, 4010 West Broad Street, Richmond, Virginia 23230-1104. Second class postage paid at Richmond, Virginia and additional mailing offices. POSTMASTER: Send address changes to *Virginia Wildlife*, P.O. Box 11104, Richmond, Virginia 23230-1104.

Subscription department: 804/257-1251. Rates: one year, \$5.00; three years, \$12.50.

Submission guidelines available upon request. The Commission accepts no responsibility for unsolicited manuscripts, photographs or artwork. Permission to reprint material from *Virginia Wildlife* must be obtained from the writer, artist or photographer as well as the managing editor.

Observations, conclusions and opinions expressed in *Virginia Wildlife* are those of the author and do not necessarily reflect those of the members or staff of the Commission of Game and Inland Fisheries.

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Ruffed grouse; by Nell Bolen

by Charles Blem

# *Birds of a Feather*

**Ruffed grouse and wild turkeys are linked by blood and behavior**

## The ruffed grouse and wild turkey share many of the same habits and behavior —because they share a common ancestry.

A flash of woodland wings or a dark shape slinking away at the edge of the forest—this is about all many people see of two upland forest gamebirds of Virginia, the ruffed grouse and the wild turkey. These species are well known to skilled and dedicated hunters, but the average outdoorsman may not be aware of some aspects of their biology. In fact, there is quite a bit of misinformation or confusion regarding these birds.

Grouse and turkeys are gallinaceous birds, that is, they belong to the taxonomic group that includes the pheasants, quail, ptarmigan, chickens, guinea fowl and their relatives. Thus, they are similar in a number of ways. For example, both species produce precocial young—chicks that can run, hide and feed themselves soon after hatching. This is the opposite of altricial young—the helpless nestlings produced by many other species, particularly songbirds.

The young of grouse and turkeys both require a diet high in protein—which means insects. The nests of turkeys and grouse are open structures, usually well-hidden in thick cover. Both species produce eggs at about the same time of year, mid-March to late May, and produce similar numbers of eggs per nest (grouse normally have 9-12; turkeys, 12-15). Turkey eggs are finely speckled with brown on a buff background. Grouse eggs are brownish, sometimes with a few faint brown markings. Turkey eggs are 2.6 inches x

1.9 inches; grouse eggs 1.55 x 1.15 inches. Incubation time is 21-28 days for ruffed grouse and about 28 days for turkeys. Occasionally, more than one female turkey will lay eggs in the same nest, but nests are usually attended by single females only. In both species, males play no role in nest defense or care of the young.

The similarities end when you come to size, however. Ruffed grouse average about  $1\frac{1}{4}$  to  $1\frac{1}{2}$  pounds while turkeys are much larger, perhaps as much as 20-25 pounds. The maximum weight of wild turkeys has been hotly debated and perhaps exaggerated in some circles. Stories of turkeys of 30, 40, or even 50 pounds have been told, but further fuel should not be added to that fire. In a study of the weights of 82 turkeys from Virginia, the heaviest was a tom of 17.1 pounds.

Wild turkeys in some cases have a mixed ancestry that includes domestic stock bred for weight, thus most game biologists conclude that very large “wild” birds may be the result from such mixed parentage. Those who kill large turkeys should check for white feathers; these may be indicative of domestic turkey ancestry. Otherwise, be sure to weigh your turkey on a very accurate scale, but be aware of the admonition repeated by A.W. Schorger in *The Wild Turkey: Its History and Domestication*: “When you kill a gobbler of twenty-five or thirty pounds, do not weigh him; they generally resent such a proceeding by falling off from five to



Wild turkey poult; by William S. Lea

ten pounds."

Grouse and turkeys have breeding systems which ornithologists call polygyny—males form pair bonds simultaneously with several females each season. Both the grouse and turkey cocks exhibit breeding displays at specific sites in the forest. The grouse fluffs his feathers, shows his famous "ruff" (feathers around the neck) and beats his wings in a way that produces a muffled "roar" called drumming. The ruffed grouse's scientific name, *Bonasa umbellus*, comes from this sound (*Bonasa* means "roar"; it refers to the bison or bull and the sounds such an animal makes) and its neck ruff (*umbellus* means "umbrella"). Turkey cocks also display in a fashion that includes wing shaking, strutting and spreading of the feathers, but the noises produced to attract females are mostly vocalizations—the famous "gobbling."

Although they may overlap in some areas, grouse are generally confined to higher elevations in Virginia, utilizing overgrown and abandoned sites for foraging, and adjacent timber stands for cover and roosting. They will often be found in what hunters call "grousy" areas, overgrown with wild grapes, briars, and honeysuckle. Turkeys, on the other hand, though once thought to require huge, undisturbed tracts of hardwood timber, have adapted quite remarkably to just about every forested area in the state. They require open areas with high insect populations for raising their young in the spring, and hardwood forests for the fall mast crops of acorns. They also utilize pine stands, scratching around the base of trees for grubs in the fall, and have been known to relish a good crop of soybeans that's located next to forested cover.

The wild turkey was first domesticated at least 1,000 years ago by Indians in the southwestern United States. The ruffed grouse, however, is a native species that has resisted domestication. Natural mummies of turkeys and deposits of turkey excrement have been found at ancient Indian dwellings such as Mesa Verde. The Spanish apparently acquired turkeys from the Indians and introduced the species into Europe in the 16th century. Later, the early European colonists on the Atlantic Coast obtained tame turkeys from local Indians. The scientific name of the wild turkey, *Meleagris gallopavo*, was coined by Europeans who confused the bird with species more famil-



Young turkeys and grouse both require disturbed areas with high insect populations. As they grow older, their diet becomes more generalized. Above: Wild turkey in woods; photo by Steve Maslowski. Left: 2-day-old turkey poult; photo by Nell Bolen.

For further information about ruffed grouse and wild turkeys, see:

Johnsgard, P. A. 1985. *The Grouse of the World*. University of Nebraska Press, Lincoln.

Schorger, A. W. 1966. *The Wild Turkey: Its History and Domestication*. University of Oklahoma Press, Norman.

Williams, L. E., Jr. 1981. *The Book of the Wild Turkey*. Winchester Press, Tulsa, Oklahoma.

iar to them (*Meleagris* means guinea fowl and comes from mythology; *gallus-pavo* is a combination of the Greek words for chicken and peafowl).

The myth of the turkey as a stupid bird comes from characteristics of domestic stock; the wild bird is very intelligent and wary. Domestic turkeys, through inbreeding and selection for traits that make them desirable as domestic stock, tend to be slow-witted and prone to weaknesses such as high blood pressure, low resistance to disease, and a tendency to die suddenly as a result of small disturbances. Wild birds, on the other hand, are tough, wily animals and are difficult to see or study. An often-told myth is that young turkeys will look upward toward falling rain and drown. There is no evidence of such activity.

Grouse in primitive wilderness are so tame that they are sometimes called "fool hens." In Minnesota and Canada they sometimes refuse to move out of the path of cars and I have approached them to a distance of a few feet. However, the birds become wise and wary in less rural environments, particularly when hunted.

The truth about turkeys and grouse in some ways is actually stranger than the mythology. Several examples may illustrate this. The turkey gizzard is inordinately powerful—so much so that it is capable of flattening iron tubing or of grinding up needles or surgical blades fed to the bird. In nature, this organ is capable of grinding walnuts or pecans to bits in a few minutes.

Both turkeys and grouse have caeca, blind pouches at the junction of the small and large intestines. These assist in the digestion of vegetation by breaking down cellulose.

Grouse and turkeys have breast muscles that are composed mainly of "white" fibers. These are adapted for rapid contraction for short periods, but become fatigued quickly. It has been said that if one can flush a ruffed grouse three or four times it becomes so exhausted that it can't fly and may be picked up!

We never seem to associate two birds so different in appearance and size as the wild turkey and ruffed grouse—but indeed they are cousins, each occupying its own space, own specialized niche in the environment, and sharing an ancestry. □

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Charles Blem is an ornithologist and professor of biology at Virginia Commonwealth University.



Both turkeys and grouse build well-hidden ground nests in good cover, and begin producing eggs from mid-March through late May. Top: Ruffed grouse hen on nest; photo by David Davis. Left: Ruffed grouse; photo by Nell Bolen. Above: Ruffed grouse nests with eggs; photo by Gregory K. Scott.



# Wood Sprites

by Nell Bolen



A 2-week-old grouse chick

Nell Bolen spent 15 weeks watching and photographing a grouse brood. Beginning in the spring she followed the brood and recorded these exquisite images of grouse behavior.

# *Wood Sprites*



*Two-week-old grouse chicks "putt-putting" at strange object*

**C**hicks traditionally hatch out during the first week of May in Virginia, and within a day are able to follow the hen to her brood range. This area is in good cover, interspersed with both cleared and forested areas. Since the young chicks feed exclusively on small insects for the first three weeks, they need good "bugging" areas of clearcuts or open areas. After one week, the chicks begin hopping, leaping, then flying, rapidly increasing their altitude and range. They feed, sleep at night, loaf in sunspots, preen, dust, stretch their wings, and challenge each other.

As the chicks grow and their brood range expands, they naturally come into unfamiliar territory. Anything in it that is the least bit different or out of the ordinary is cause for "putt-putting." The birds draw themselves up very tall, stick their heads out and circle whatever it is that is unfamiliar. Notice in the photo above that their feathers are erect, particularly their neck feathers, which will become the ruffs of the adult plumage.

# Wood Sprites



*An 8-week-old grouse chick "limb walking"*

**A**t about three weeks, the chicks begin to "limb walk." Hopping from one lower limb of a tree to another, they walk its length, hop over to another, and repeat the sequence over and over again. They also begin to experiment with eating vegetation at this point, particularly the tender shoots of honeysuckle, Virginia creeper and jewelweed. By eight weeks, the chicks no longer need brooding, and as the weeks pass, they become more and more independent of their brood mates and the hen. Each chick wanders, keeping in touch with the group and hen through vocalizations. They most often use a "whoop-whoop" call to maintain contact while feeding. Grouse are very social birds, and if one bird is alarmed, the rest will immediately hide and freeze until the danger passes. Once I watched as a red-tailed hawk flew over a field diving at, though missing, one of the chicks. With a scream, the one chick alerted the rest of the brood, which scurried for cover, and remained frozen for about 15 minutes, though the hawk had long since flown off.

# Wood Sprites



*An 11-week-old chick "loafing"*

Over the eight to 13 week period of development, grouse lose their juvenile feathers. Note how ragged the juvenile tail feathers are in this photo. Very soon they will drop off and the adult plumage will come in. I was surprised at how much time during the day the birds spent loafing, in addition to dusting themselves one or two times per day for 20-30 minutes at a time.

As with most broods of gallinaceous birds, grouse chicks develop a pecking order—a hierarchy of who's who in the brood. They do this during the first few weeks of life by challenging one another. Usually, the largest chick will become dominant, but there is also a number 2 bird, a number 3 bird and so on, right down the line. One chick will challenge another by imitating adult male courting and fighting display, with a tall posture, erect ruff, tail fanned out, wings drooped, and hissing.

# Wood Sprites



A 15-16 week fully feathered grouse cock

**B**y 15 weeks, grouse will be fully feathered in adult plumage. Aggression becomes much more frequent, and any day now fall dispersal will begin and each bird will leave the group to find a winter territory. No one is certain what triggers fall dispersal, but it is often associated with weather changes . . . a cold front moving in, a fall rain storm, and changing day length. For males, dispersal means locating an area with adequate food, cover, and a drumming stage. The hens also disperse, but select suitable nesting sites in addition to good food and cover. The brood hen will return to an area not far from her original nest.

# Wood Sprites



*Grouse cock drumming*

Some of the males who have just reached adulthood will be big and strong enough—or lucky enough—to find a good winter territory for themselves. Sometimes this means challenging and defeating an older resident male. Other times, a new grouse will just happen by a recently vacated territory. At any rate, if the new male does succeed in obtaining a territory, he will often become a drummer at age 20 weeks, during this first autumn. The other new males who are not so large or not so lucky, will eventually find a place to winter, but it may be quite a distance away from their starting point. Most likely, the area will not have optimum food and cover, and usually the bird will not drum because there will be a dominant male nearby who will attack him and run him off if he tries. The subordinate male must await a later opportunity.

# Ground Dwellers

## A photographic essay

text by Virginia Shepherd

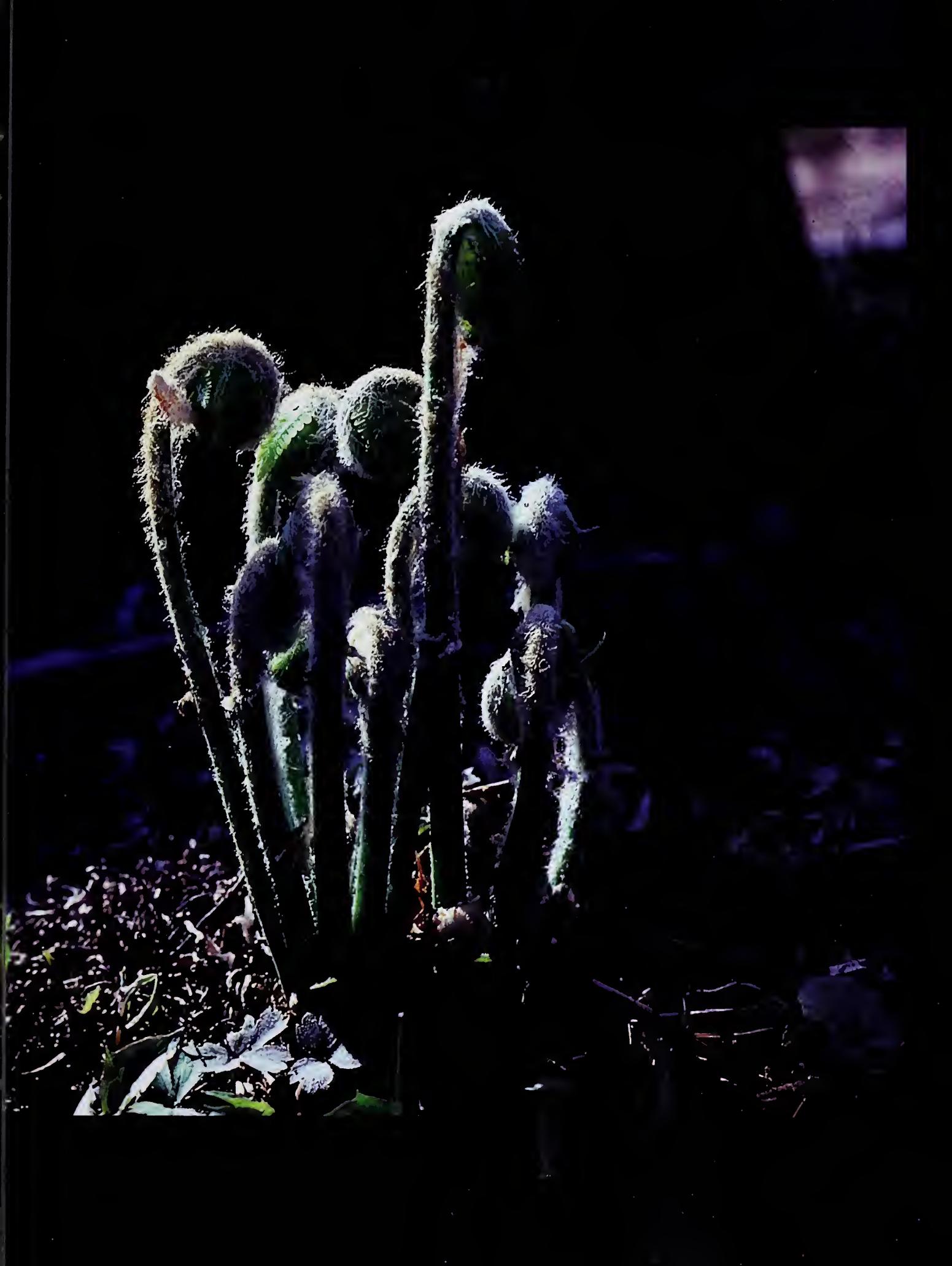
**W**hen we walk in the woods in the spring we're looking for something different—some whistle, call, or color. We're waiting for things to surprise us again at the same time and in the same places. So, when we catch sight of the bloodroot that bloomed under the same leafless hardwood stand, we eagerly mark down the date and location in our journals. We might even stop for a few moments to gaze at the complexity of the flower, its sepals, anthers, pistils, and petals. And we might learn its scientific name, identifying it with some pride in our thumbworn wildflower guides.

But we know and see so little. There are so many other organisms that encounter these flowering plants. For them, these plants are landmarks—part of a home range that is essential to survival. They might eat them, use them to escape from predators, or crawl around them in order to reach a burrow or a nest. It is these ground dwellers that we so often forget because we never encounter them. They may be hidden, but they are the insiders. They are on the inside of a life dependent on the woods that most of us have lost track of. Their feet and bellies never lose touch with the ground.



**T**he interrupted fern (*Osmunda claytoniana*) exists on top of Apple Orchard Mountain, where a salamander native to the area also takes up residence. *Plethodon hubrichti*, the Peaks of Otter salamander, is a small amphibian abundant only in the Peaks of Otter. This specialized salamander lives under rocks, logs and leaf litter, and on foggy, warm nights, will come out of its hidden place to become a terrorizing predator of insects and other invertebrates; photo by Dave Catlin, inset by Joseph C. Mitchell.





**U**p in the high mountains of the southwest part of the state, in the fir-spruce or spruce-yellow birch forests, you can find the shamrock leaves and round-petaled flowers of *Oxalis acetosella* (*O. montana*) or wood sorrel, sheltered and spreading out under a hemlock or fir tree. In Smyth, Grayson, and Washington counties, the wood sorrel blooms from May through July at high elevations. Claiming the same territory is the Yonahlossee salamander (*Plethodon yonahlossee*). It is the largest (by weight) terrestrial salamander in the state, and keeps itself hidden by the use of extensive burrow systems. On still, warm evenings from spring through fall, *Plethodon yonahlossee* will emerge from underground and hunt, moving through vegetation—a silent predator; Photo by Bill Portlock, inset by Joseph C. Mitchell.





While struggling up a trail in the southern Blue Ridge Mountains, your eye might be caught by the flash of red—a flame azalea (*Rhododendron calendulaceum*) in the middle of a clump of New York fern (*Thelypteris noveboracensis*). But, at the bottom of the slope you're standing on might also be a hidden bog turtle (*Clemmys muhlenbergii*) crawling over sphagnum moss or maneuvering through an alder stand. This rare turtle is very small, only about four inches long, and is seldom seen because it buries itself so well in the mud. The turtle is located in small pockets of the state in cool, high elevations, having formed small, discrete populations which probably date from the Pleistocene era; photo by Dave Catlin, inset by William S. Lea.



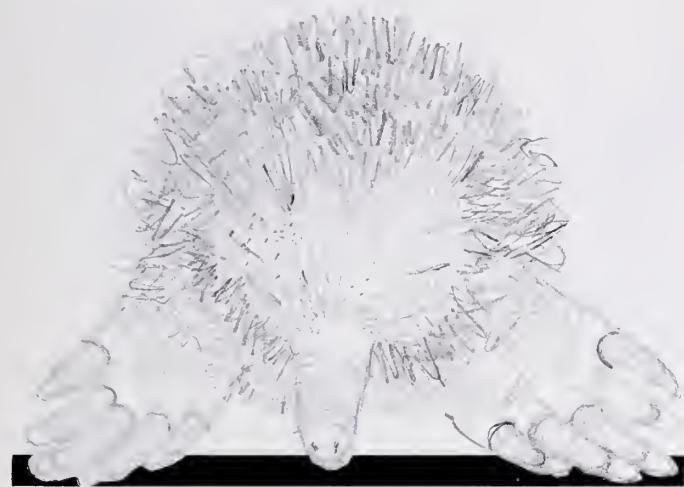
You've probably seen bluets in your lawns, or on stream banks, and *Houstonia caerulea* is an adaptable wildflower of the bedstraw or Rubiaceae family, abundant in all but 11 counties in the state. But, while this plant of flexible needs might be able to survive everywhere from grassy slopes to thickets, a wood turtle (*Clemmys insculpta*) crawling over bluets on its way to water is more specialized. The northern part of the state marks the southern extension of its range, and even there it is relatively uncommon. A semi-aquatic turtle that can achieve the awesome land speed of 0.2 miles per hour, *Clemmys insculpta* wanders through forest and floodplain, foraging on anything from a succulent bunch of violets to a diving tadpole; photo by Bill Portlock, inset by Michael P. Gadmoski.





In the rocky woods, at higher elevations in the state, you might find Appalachian sedum (*Sedum telephioides*) clinging to a crevice that would have made a good foothold. This plant, also called Live-For-Ever, blooms from July through September, and has been found in the central and northwestern part of the state, and also in Washington, Grayson, and Carroll counties. If you're in the Blue Ridge, or west of it, and happen to find that plant somewhere from 1100 to 3400 feet in elevation on a south-facing rock face, you might be staring at a plant that a timber rattlesnake (*Crotalus horridus horridus*) slithered by on its way to its den in October. Timber rattlers migrate to denning sites in the fall, and local populations will congregate at the same site. By May, they will have emerged from their winter hibernation, mated and dispersed to within eight miles of their dens, giving birth to live young from late July to September; photo by R.C. Simpson, inset photo by Shawn Green.





# The Earth Shifters

by John F. Pagels

**Tunneling, burrowing,  
shoveling their lives away  
underground, the moles of  
Virginia are forgotten  
caretakers of our soil.**

**MOLES!** They're everywhere—from sea level to the tops of our highest mountains. But, whether we're reveling at the beauty of wildflowers in spring, or snoozing beside a shade tree in summer, we probably won't see one—and they can't see us, not even when they're above ground. Let's take a closer look.

Three species of moles occur in Virginia and all live underground, at least most of the time. Moles possess a wealth of adaptations for their specialized existence. However, as is so often the case when certain functions become highly specialized, others are often nearly lost.

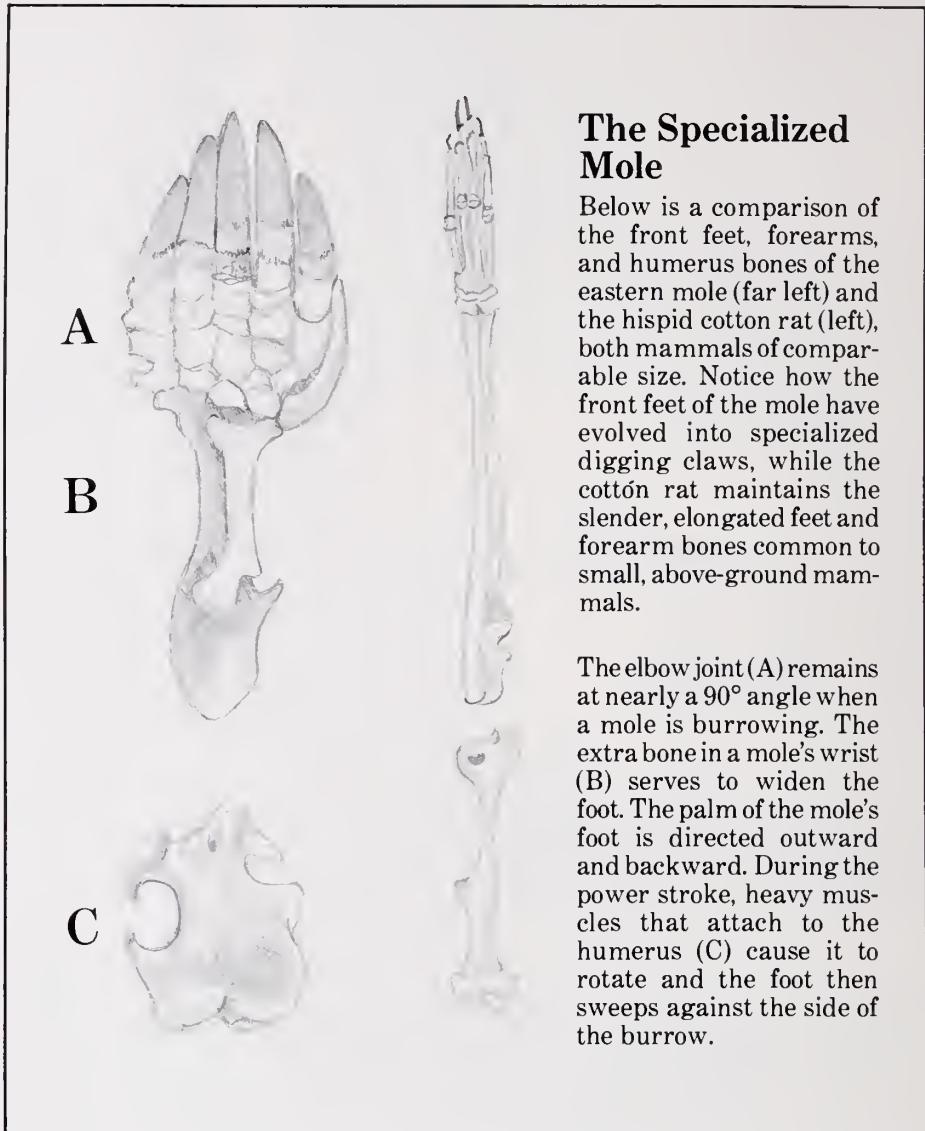
Eyes are a good example of such a trade-off in moles. Vision can be of little use as a means for sensing much about the environment in the total darkness of burrows. Thus, the tiny eyes of moles are remnants of the normal eyes possessed by their predecessors and above-ground relatives. Indeed, their pinhead-sized but complete eyes are probably capable of perceiving little more than shifting shadows.

Even their ears are greatly reduced. In the case of ears, however, hearing is still present, but the external ears, or pinnae, have been lost. After all, they would be of little use in burrows, and perhaps even hinder moles by catching in tunnels and filling their ears with dirt.

**A**n obvious feature of a mole is its hair, which is different than that of most mammals, however. Most mammals possess two kinds of hair, underhair and guard hair. The hair, or pelage, serves a variety of functions. The soft underhair is important in temperature regulation and the longer, coarser guard hairs protect the underhair, and is colorful and important for camouflage. To an animal like a mole that spends most of its time underground, however, camouflage is not too important and the colorful guard hairs are lacking. In fact, most moles have no guard hair at all. A mole's fur is very dense and soft, good for keeping warm, and perhaps more importantly, for easing through tight corridors underground.

A close look at the coat of most mammals reveals that their fur is somewhat flattened, with the tips of the hairs directed toward the tail end. It's that way for a couple of reasons. When a mammal is cold the nervous system sends messages to muscles located in the skin. These muscles contract, pull on the base of the hair, and cause it to stand up. With more dead air spaces, the fluffed-up coat provides more insulation. We humans also have these muscles—we just don't have much hair to fluff up.

There's good reason for a mammal's hair to be directed toward the tail end. For most mammals that live on land, it would be difficult to move forward through vegetation if they had to bend back hairs that were pointed forward. But, it's not that way for moles. With one-directional fur, a mole would have a hard time making a backward escape out of its burrow. Thus, a mole's hair



## The Specialized Mole

Below is a comparison of the front feet, forearms, and humerus bones of the eastern mole (far left) and the hispid cotton rat (left), both mammals of comparable size. Notice how the front feet of the mole have evolved into specialized digging claws, while the cotton rat maintains the slender, elongated feet and forearm bones common to small, above-ground mammals.

The elbow joint (A) remains at nearly a 90° angle when a mole is burrowing. The extra bone in a mole's wrist (B) serves to widen the foot. The palm of the mole's foot is directed outward and backward. During the power stroke, heavy muscles that attach to the humerus (C) cause it to rotate and the foot then sweeps against the side of the burrow.

actually lies in neither direction. Better yet, it lies in both directions, and a mole can crawl backward through the burrow as easily as it can move forward.

Probably the most dramatic feature of a mole is its greatly enlarged front feet. Moles have large and shovel-like frontfeet with broad and powerful claws. They wouldn't make very good hiking boots, but they're great for a mole. As in most mammals that live underground, the length of the limbs of moles are greatly reduced—if for no other reason than they take up less room. Certainly, the longer the legs, the larger the burrow would have to be. And larger burrows mean larger predators, not to mention the added work to build warm nests. But, the main reason that these mammals have short limbs seems to be for leverage.

Imagine having a large-bladed shovel that has a long handle. Imagine also

that in order to use the shovel you had to grip the handle at the end, *farthest from the blade*. Well, if the soil was soft, loose and didn't weigh very much, you could dig a very small trench before you tired. Certainly, if you had to "build a house" in such a fashion, however, you wouldn't have the energy to search for food and water, find a mate, fatten up for the winter, much less escape from predators! So, moles have large, short-handled shovels.

But, here's another example of a trade-off. This remarkably powerful digging adaptation has left the mole capable of little other arm movement, whether it's in its burrow, in water, or even trying to crawl out of your hand.

Most of us know what a mole looks like. But what if you're wandering in the mountains, binoculars swinging from your neck, camera bouncing off your binoculars and you see a short-



### **Eastern Mole** *(Scalopus aquaticus)*

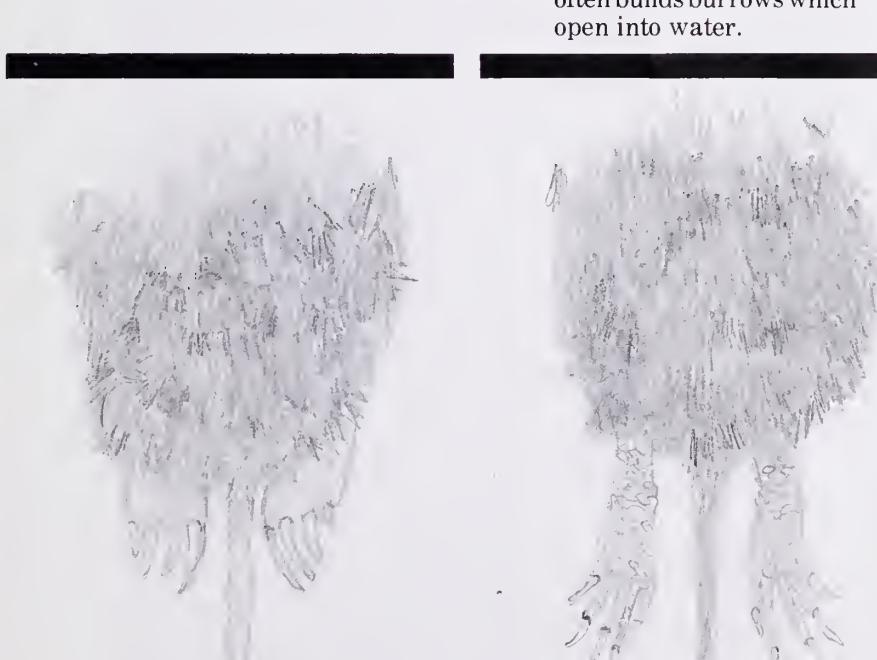
Occurs statewide, but only below 2,000 feet in the mountains. Its pelage is of uniform length, and gray to nearly black. Its nose is plain, tail short and naked. This is our most common mole, and unlike other moles, the eastern mole rarely pushes up mounds (or molehills) when digging deep burrows.

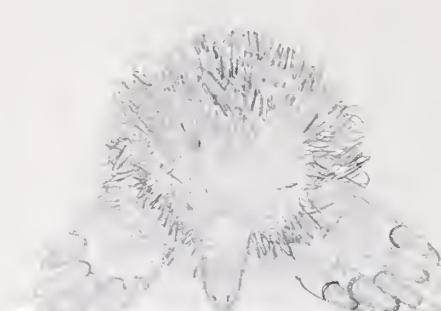
### **Star-nosed Mole** *(Condylura cristata)*

Occurs statewide, but very rare in all but the northern part of the state. Its guard hairs are evident in its pelage, which is blackish brown to black on the back and somewhat paler on the belly. Its "star" nose has 22 "tentacles," and its tail is long, stocky and scantily haired. Like other moles, its young are hairless and toothless at birth, but their front feet are relatively large and have adult form. A good swimmer, the star-nosed mole often builds burrows which open into water.

### **Hairy-tailed Mole** *(Parascalops breweri)*

Occurs in the mountains, but only above around 2,000 feet. Its pelage is of a uniform length and nearly black. Its nose is plain, tail short and covered with coarse long hair. The burrows, like those of the other moles, are shared by other small mammals, including various shrews, mice and voles.

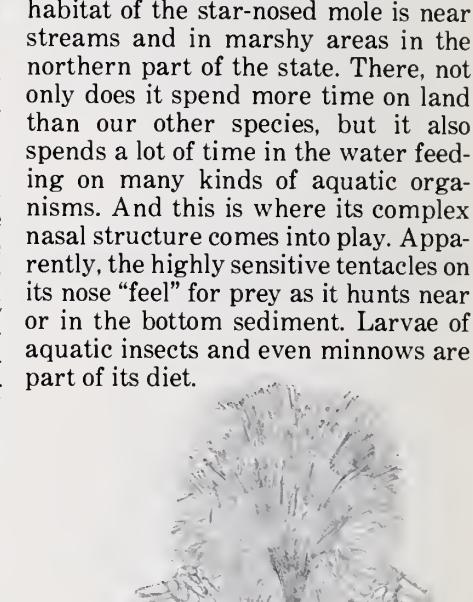




tailed mole pulling itself across the hard-packed gravel trail? How do you know what you're seeing? You didn't bring a mole book. Thinking back for a moment to the heads and tails of our three Virginia species, you remember that one has a relatively long tail, and one of the two short-tailed species has a hairy tail. Thus, you've just seen a hairy-tailed mole, *Parascalops breweri*, a species at home only at higher elevations in the state.

Though you'll only see the hairy-tailed mole in the mountains, no matter where you live in the Commonwealth, the odds are pretty good that the pushed-up roofs of shallow feeding burrows in lawns and gardens and forest and fields were made by the eastern mole, *Scalopus aquaticus*, the other short-tailed species in the state.

The kinds of soils and the hardness of the soils in which we sometimes find fresh burrows attest to the great strength of all our moles. While simply getting around, perhaps in search of mates and food, moles create burrows that are just below the surface of the ground. On the surface, these burrows are often marked by pushed-up ridges; ridges that are often the only sign that a mole is in the area. Depending on conditions, they may also dig deeper tunnels which are often used for shelter and for nesting areas. These deeper tunnels may be several feet deep. During construction, if soil cannot be compacted or pushed aside, it is pushed to the surface as the mole turns around to dig in another direction—and presto! Mole hills.



around more easily in softer, more friable soils, but there is also an abundance of food in these soils. And it is not our domestic plants or lawns or even early wildflowers that they're after. Insect larvae, grubs, and earthworms are the mainstay of their diet. Both the eastern mole and the hairy-tailed mole use their sensitive pointed noses for sniffing out food. An eastern mole that we had as a family pet thrived on fishing worms, but seemed to truly relish—and never had any trouble nosing around and finding—daily side orders of liver sausage that we placed in its, ah-hh—soil.

**B**urrowing activity by moles can be very helpful to soils—just as tilling our gardens is good for the soil and our cultivated plants. Not only is the soil aerated and its water holding capacity increased, but leached minerals are returned to the surface by a burrowing mole. Unfortunately, mole activity can be harmful to cultivated plants and lawns, especially if the family dog digs up the mole's burrow in search of the mole. However, more often than not, when damage has been done to vegetation because of a mole, it's the work of other small mammals that use the runways dug by the mole. A common culprit is a small reddish-brown rodent known as the pine vole. This mammal is an herbivore and will use mole burrows as thoroughfares to reach a meal, whether it be vegetables above ground or the tasty roots of an apple tree. All of this makes the mole, an otherwise highly interesting and beneficial animal, a pest to many people.

The star-nosed mole, *Condylura cristata*, is our one mole that spends more time out of burrows than in them, and often becomes the food for sharp-eyed and sharp-eared hawks and owls. While both the eastern mole and the hairy-tailed moles crawl very slowly on land, dragging their hindlimbs along behind them, the star-nosed mole uses all four limbs in locomotion on land, with its long tail playing an important

supporting role. I've observed one running around, although not rapidly. And in a cage, it not only got up on its hindlimbs, but also jumped several inches up the side in its attempts to escape. Even its pelage is better adapted for periods of activity outside of a burrow, with coarse, and protective guard hairs.

Although moles are generally more abundant in good soils, the preferred habitat of the star-nosed mole is near streams and in marshy areas in the northern part of the state. There, not only does it spend more time on land than our other species, but it also spends a lot of time in the water feeding on many kinds of aquatic organisms. And this is where its complex nasal structure comes into play. Apparently, the highly sensitive tentacles on its nose "feel" for prey as it hunts near or in the bottom sediment. Larvae of aquatic insects and even minnows are part of its diet.



**A** large and common race of the star-nosed mole occurs in the northern part of the state. But, the remainder of Virginia, including the mountains south of Highland County and nearly all of the coastal plain down through the Carolinas is occupied by a smaller and uncommon variety. It's not known why this mole is rare, but this is an animal that suffers as marshes are drained and lowlying areas disturbed. Only two sightings of this mole have been recorded for central Virginia. These two records are significant not because they represent two dots on a map, but because those sites represent areas capable of supporting this uncommon animal, in a region that too often shows the manipulative and destructive hand of man.

Although rarely seen, moles represent the complex diversity of animal life, and remind us that there is something special about the soil we walk upon. After all, if we have moles, might there not also be wildflowers blooming nearby? □

*John F. Pagels is a mammalogist at Virginia Commonwealth University.*

# Virginia's Pines: Food For Thought and Wildlife

by Rick Preve



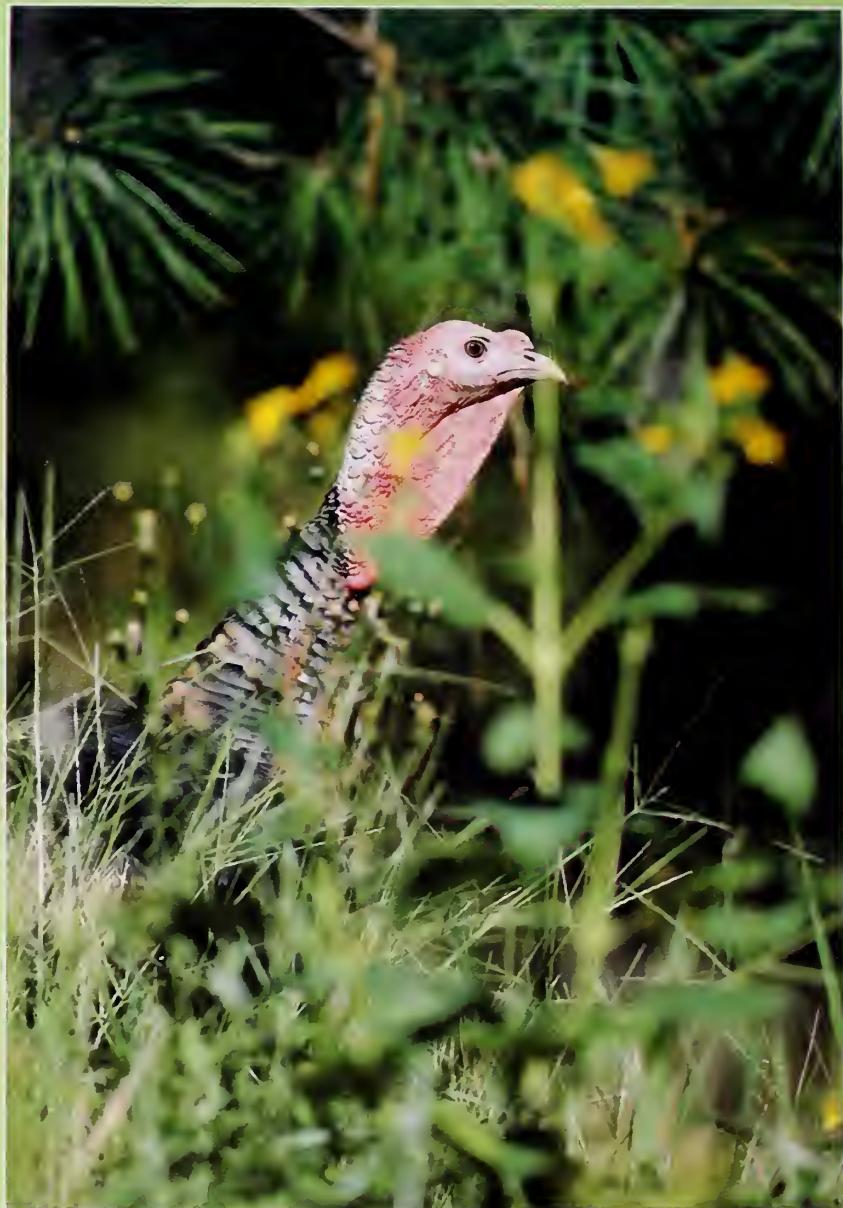
**S**pring is tree-planting time for foresters in Virginia. All across the Commonwealth, we are busy planting the forests of tomorrow. Foresters managing the strip-mined lands of the western counties are planting or seeding white, Virginia, and pitch pine on mined ground. In the Jefferson and George Washington National Forests white pine seedlings are being used to replant harvested areas. And in the rolling hills of the Piedmont and the sandy flats of the Coastal Plain, loblolly pines are being planted by the millions.

Pines, pines, pines. Can't you foresters think of anything else? From the country store to the cocktail party the question is posed to me relentlessly. Do we really need all those pines? And doesn't planting acre after acre of pine "monocultures" hurt wildlife habitat? The answers are yes to the first question and a qualified no to the second one, and I invite you to join me on a drive through my home woods here in western Albemarle County, at the foot of the Blue Ridge mountains, to find out for yourselves.

First though, let's take a look at the statewide picture and try to answer the first question. From the 1930's to the 1960's Virginia's pine forests benefited from programs such as the Civilian Conservation Corps and the Soil Bank. The millions of pine trees that provide us with present-day forest products were planted or naturally seeded on abandoned agricultural land at that time. Since 1965, however, statewide forest inventories have shown a decline in the number of young pine seedlings being planted or seeded. This is because many small, private woodland owners are harvesting their pine forests and neglecting to replant them with pines.

The resulting forests of low-quality hardwoods can be utilized to some degree, but most of Virginia's forests can grow pine trees better and faster than they can grow hardwoods. When this is added to the loss of timberlands by their conversion to other uses (such as shopping centers full of junk-food joints), and the fact that the nation's demand for pine products from the South is expected to double by the year 2030, we see that those pines not being planted will be badly needed.

As far as wildlife habitat is concerned, pines can increase, rather than decrease, the quality and diversity of wildlife habitat. This is particularly true where a pine plantation is estab-



*Wild turkeys use young pine plantations for feeding, nesting and rearing their young; photo by Joel Arrington.*



Above: Cottontail rabbits use the understory growth in pine plantations for cover; photo by Karl Maslowski. Right: Bobwhite quail will use recently burned or clearcut areas to feed in, and the herbaceous understory for cover and nesting areas; photo by Nell Bolen.



lished within a hardwood forest, especially if the pines are planted in small, scattered patches that follow the contour of the terrain, because the pines will then add to the mix of trees present in a forest. Leaving grassy strips or patches of shrubs and hardwoods within a pine plantation is also beneficial. Yet the pines themselves, and the forestry practices used to manage them, can greatly enhance wildlife habitat. Let me give you some examples.

If you drive with me just two miles from my dad's farmhouse, on a winding road behind the Batesville country store, you will find a clearcut where young loblolly pines have been planted. We could bring along scientific studies that have shown the habitat value of young pine plantations. We could read about my friend Ed Childen's research near Appomattox, which showed that the density and diversity of songbird populations increased in young pine plantations when measured in comparison to uncut hardwood forests. Or we could read about Todd Holbrook's research work with Westvaco, a major forestry company, which showed that wild turkeys used young pine plantations for feeding, nesting, and rearing of young poult. But if you visit this particular site in the fall, the best argument will be the presence of many figures in blaze orange clothing walking through the rows of trees, the pine seedlings lapping at their knees, with Brittany spaniels and shotguns busy with quail, the little brown bombers flushing in front of them with a whirr. And in the warm summer days it will be the field sparrows and prairie warblers that will tell you that they feel at home here.

The clearcut is dotted with the snags of dead hardwood trees that were left by the loggers, but were later injected with herbicide to make room for the growing pines. On one of these snags a young red-tailed hawk often sits, perched high above the weedy field below, waiting for a field mouse to make a move. If you follow his glide as he hunts you will see him fly across Dollins Creek and over the hills to a neighbor's farm. Here, a field once existed where the cows had grazed the grass so short that almost nothing shielded the red clay soil from the rain, and gullies began to crisscross the land. The neighbor finally took his cows off and a stand of Virginia pines began to grow on the formerly barren site. The

pines came with the wind that blew their seeds from the surrounding forests, so they are not ordered in neatly aligned rows. I don't know if this matters much to my neighbor, but I know that it doesn't to the young hawk, who soars above the saplings and the small patches of open ground in between them, full of broomsedge and honeysuckle. The hawk knows that rabbits are almost as thick as the pines here now, and so do the local beagling club and many rabbit hunters like me. The pines may be growing timber and holding the soil in place for our neighbor, but in the meantime they are growing food for the hawks and shelter for the rabbits.

Further down the road in between the apple orchards, your eyes may catch a glimpse of orange paint in a loblolly pine forest. This is a 30-year-old stand that I marked for thinning last summer. Taking care of existing pine plantations, in addition to planting new ones, can also be good news for both wildlife and timber. Properly thinned pine plantations will grow more rapidly and healthily if the light, water, and soil nutrients are left to be shared by a smaller number of trees. The increased amount of light filtering through the thinned canopy will stimulate the growth of tender shoots and grass, which make good browse for deer. The flowers, buds, and seeds from this increased herbaceous growth on the forest floor will attract and maintain insect and bird populations.

In the future, I may recommend the use of a prescribed fire to the owner of these pines. A prescribed fire is a controlled, low-intensity fire that is set by timber managers to remove the understory vegetation that could fuel a disastrous crown fire. After a prescribed fire, it is much easier for turkeys and quail to find pine seeds in the needle mat on the forest floor. This point was made clear to me in forestry school when we were forced to pretend that we were wild turkeys and, on our hands and knees, were made to count pine seeds on the forest floor. And since turkey and quail, among other birds, nest on the ground, prescribed fires at the right time of the year are a good way to make sure that wildfires won't occur during the nesting season. If you would have accompanied me last summer as I walked in this woodlot, a can of orange paint in my hands, you would have witnessed the covey of quail that I flushed by the powerline right-of-way, or the doe and fawn that stared at me,



*Red-tailed hawks frequent pine plantations for rabbits and rodents; photo by C.W. Schwartz.*

water shining on their noses, from the creek at the edge of the pines.

The same road climbs and wanders through the hills of red clay. And there, on the land which was a farm that my family once owned and on which I lived, you will find a subdivision with its many rows of small cottages and paved driveways.

The houses are shaded by groves of 50-foot tall Virginia and shortleaf pines, spared from the blade of the bulldozer by the kind eye of a landscape architect or developer. I do not know if they were planted or if they just invaded that abandoned pasture which we never used. They probably will never be harvested for timber but will be left to shade lawns and begonia beds through old age, their branches and cones occasionally used for kindling or as Christmas decorations.

But even so, they will be useful, not only to the homeowner's net worth through their shade and esthetics, but to the many birds that gather in their crowns in the winter months. I have seen brown creepers, red-breasted and brown-headed nuthatches, golden-crowned kinglets, and sometimes pine warblers seeking shelter and food in their branches. On the coldest days

slate-colored juncos and tufted titmice will also flock to these pines to escape the ice and rain. And, where the trees border a cornfield, I have counted many mourning doves dropping from one branch to the next. The trees that die are pecked and thoroughly explored by the downy and hairy woodpeckers who, while tapping the dead snags, take a quizzical look at the humans below.

It is five a.m. of the first day of spring turkey season as I drive on this same road, now dark. To the east, the glow of the lights of Charlottesville masks any hints of dawn the sky may offer. To the west, I can only guess the Blue Ridge, a mass of darkness in the dark sky. I am headed to my uncle's farm for the hunt. As I park my truck by the woods behind the back pasture, I realize how difficult it is to convince people that pines can be just as good for wildlife as they are for Virginia's economy. I wonder if it's going to be necessary to freeze time on the next occasion the question is asked, and take the person on the same tour I described in words.

I feel somewhat discouraged as I climb to the top of a ridge with my shotgun in hand, and sit by a large, dead oak tree as the sky slowly greys in the east. The top of this ridge which we call Yellow Mountain grows hickories and oaks, and red maples with slick silvery bark. But left among the hardwoods are some large white pines, remnants of an earlier stage in this forest. I have seen scratchings and rustlings of the leaves and needles on the ground, and I have wondered if the resident flock of wild turkeys may not choose to roost in the crowns of the white pines. I know that last summer a red-tailed hawk and several owls nested here, and while hunting deer in the valley below last fall, I watched one or the other end its silent glide in this pine grove. As I softly and slowly call with the yelping of a plaintive turkey hen, my thoughts go back for a moment to the subject of growing pines. It is clear that pines help wildlife survive in Virginia, that they are not just grown for timber anymore. But does anyone else know it? I start to wonder, but my thoughts are interrupted. Because, just as the very first ray of sunlight makes the silvery needles of the white pines shine, I hear, unmistakable, the enthusiastic answer of an old gobble. □

*Rick Preve is a forester and president of National Resources Consultants, Inc. in Batesville.*

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# A Bass of a Different Spot

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by Bruce Ingram

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The spotted bass, native to the western part of the state, is now darting from hooks and lines all over the Old Dominion.

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# Spotted Bass (Kentucky Bass)

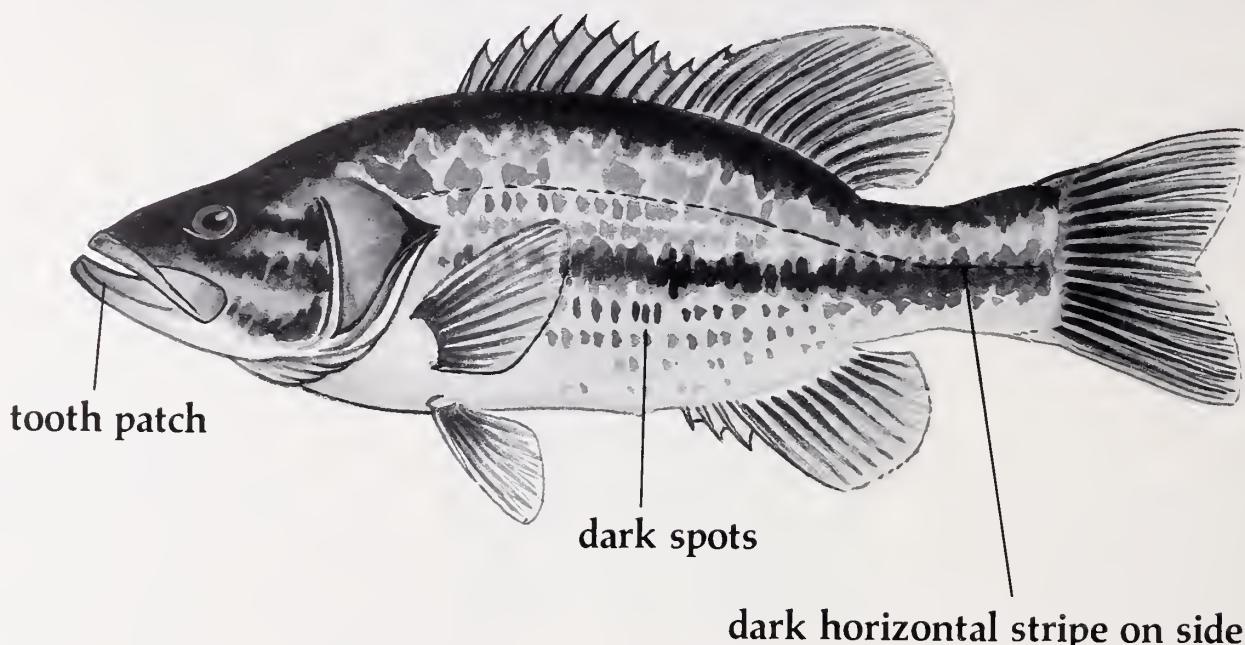


illustration by Carl "Spike" Knuth

**L**ooking like a largemouth and eating like a smallmouth, the spotted bass is often called by another name. Adding to the confusion is the fact that the spot is probably the least publicized game fish in the Old Dominion. Tangle with a spot, though, and you'll learn why a growing number of Virginia anglers are singing its praises.

First, just what is a spotted bass, where are they found in the state, and how did they arrive here? Spots, sometimes called Kentucky bass or just plain Kentuckies, get old fishermen swearing that they're a cross between a largemouth and a smallmouth. But they are a separate species—*Micropodus punctulatus*.

The easiest way to distinguish a Kentucky from a bucketmouth or a bronzeback is a tooth patch on the top of its tongue. No other black bass has this rough tongue. A spot has the general shape and coloration of a largemouth,

but a Kentucky's upper jawplate stops about the center of its eye. (A largemouth's plate goes beyond the eye.)

Other characteristic features are the fish's dark spots above and linear streaks below the lateral line. Like smallmouths, spots feed primarily on crayfish and minnows.

Dr. Robert E. Jenkins, a fish specialist at Roanoke College, says that in Virginia, spots are known to be native only to the Big Sandy and Tennessee drainages. Though they have been recorded in the New River since the late 1920's, they probably are not native to that system. Today, however, the New and its reservoir, Claytor Lake, are the best places to angle for Kentuckies in the Old Dominion.

David Whitehurst, a regional fisheries supervisor for the Game Commission, says spots were successfully introduced into the Appomattox River during the 1970's. The fish has migrated downstream to Lake Chesdin and sev-

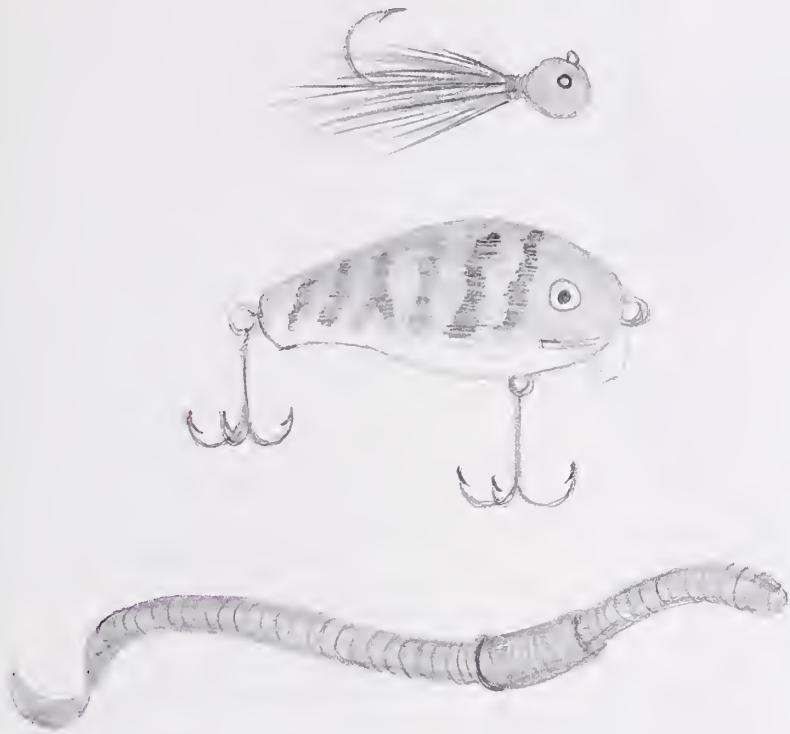
eral three pounders have recently been reported there by local fishermen.

Spots are also abundant now in the South Anna River. Dan Shuber, an assistant fisheries biologist, relates that spots are doing very well in the stream.

"Eight thousand spotted bass were stocked on an experimental basis in the South Anna in 1978," says Shuber. "We put in 2,000 more in 1979 and 4,000 in 1980. Subsequently, we have seen evidence of reproduction and there is now a self-sustaining population. In fact, the fish have migrated downstream at least 25 miles and are now in the Pamunkey River."

Spots are also found in Flannagan Reservoir, the North Fork of the Holston River, Falling River, and the Clinch River.

As the fish become more common, more and more outdoorsmen are seeking them out. Dublin's Mike Ross regularly chases spots, and knows firsthand of their sporting nature. He travels to



## Crankbaits and jigs are the lures to use on spotted bass.

Claytor Lake for spotted bass action.

"If you hook them while fishing deep," says Ross, "they'll fight just as hard as a largemouth. A spot's 'pulling' ability is very similar to a largemouth's. But, hook them on a topwater lure, and they'll jump around on the surface like a smallmouth."

A key to finding spotted bass is locating structures with deep water nearby. "They'll come up in a cove that has brush or stumps," relates Ross. "But that cover must have a steep dropoff close by. Spots are spookier than other bass and they won't go far from deep water."

Ross recommends light tackle for spots while lake fishing. He uses eight-pound test line under "normal" conditions and changes to six-pound when the water is clear. The lighter line also brings out the spot's feisty nature.

Kentucky bass don't often reach giant proportions. They are commonly ten to 12 inches at Claytor with a two pounder

being a real lunker anywhere in the state. Last year, Claytor accounted for three of the five citations given out for spots topping two pounds. The lake also surrendered the year's biggest spot—a three pound, 10-ounce trophy.

Crankbaits and jigs are the lures to use on the spotted bass. Artificials which imitate a spot's favorite food, the crayfish, usually perform well. Rapala Fat Raps and Bomber Model A's (in crawdad patterns) are favorites of spotted bass enthusiasts. Orange or brown jig 'n pigs also perform well as do plastic worms in those same colors. Again, the key is to use colors which mimic a crayfish and to work those lures around rocks and crevices where these crustaceans abound. Minnow-like plugs will take Kentuckies too.

Spots also thrive in streams—especially certain sections of them. Dan Shuber says that in the "ideal curve of a typical stream," you would find trout in the headwaters, smallmouths further

down, then spots, and finally largemouths.

Spots, though, are more likely to be found sharing the smallmouth's section of a stream, and overlap some of the largemouth's range too. They do not, however, frequent the tidal section of rivers enjoyed by largemouth bass. Basically, Kentuckies prefer moderate flow, gradient, and temperatures.

Shuber not only has stocked spotted bass, but he has also become a big fan of them.

"Spots, like any bass, are very strong fighters," says Shuber. "They are not afraid to jump. In fact, they fight better than a largemouth of the same size."

"In streams," continues Shuber, "look for spots in backwashes, eddies, and rocky areas in deeper water. If you have a choice on where to cast, always check out those backwashes first."

Shuber likes to float fish on the South Anna River for Kentucky bass. He says his typical fish is about ten inches with a few of them occasionally topping 12 inches. He also has tips for which lures to use.

"Big O's in a smaller size have to be on everyone's list," reveals the biologist. "They're my ace in the hole for spotted bass. Tiny Torpedos worked over the surface also do well. And four-inch worms in any color work well when spots are feeding deeper."

Shuber also likes to tie on 1/16-ounce jigs for spots—especially during adverse conditions such as cold fronts or stained water. The biologist employs light spinning gear for these bass and like Dublin's Mike Ross, he often uses six-pound test line.

What does the future hold for Virginia's spotted bass population? There are no plans at present to introduce it into other waterways. The original reason for stocking spots was to give anglers another sport fish in lakes and rivers that were not known as hot spots, such as the Appomattox and South Anna Rivers. And that objective has been accomplished. Spots were not stocked in the James River, for example, because the stream already had a very healthy smallmouth bass population.

Meanwhile, from May until October Virginians are seeing spots before their eyes. What better way to spend the summer? □

*Bruce Ingram is the Virginia editor for Outdoor Life magazine and a frequent contributor to Virginia Wildlife.*

# May Journal



## Book Review

*Mammals of the Carolinas, Virginia and Maryland*

by W. David Webster, James F. Parnell and Walter C. Biggs, Jr.  
The University of North Carolina Press,  
Chapel Hill, N.C.

255 pages, \$16.95 hardcover

by Jeffrey M. Curtis

A while back a friend and I were discoursing on the thought that the quality of outdoor equipment has far surpassed the abilities of most sportsmen and women. It's a fact that my retriever often tells complete strangers about the misfortune to have been placed under the authority of so mediocre a duck hunter.

I got the same feeling when I first glanced through *Mammals*. I knew that we had received a good book. *Mammals* is the result of the combined efforts of many researchers and technicians. The acknowledgements included an impressive list of mammalogists as well as professional facilities. In fact, I wondered if a book as nice as this would get the use it deserves.

Just what the book is for us is concise and photographic. When you open the book to almost any page, the first thing you see is a photograph. These are probably the highest quality pictures I've seen in a hardcover. There's one per mammal. Enough to impress you with the visual reference of the animal you're reading about. I like photos in a reference book. The ones in *Mammals* were taken with good lighting, minimal background distraction and don't seem staged. They're good photos. If you get a chance to look at a copy of this book, take a look at the full page photo of the flying squirrel.

With the photos are range maps. A bit generous perhaps, the distribution maps aren't near as exacting as the photos. Case in point; distribution of the fox squirrel in Virginia. The range map allows populations throughout the mountain areas of the state and that just ain't so. It would have been better to have used some sort of gradient or percentage graphics to put local concentrations and scarcer populations where they really belong. Still, the maps give a general representation of where the species *may* be found. And the reader needs to remember that when using the book.

The descriptions are a lot like the photos; concise and to the point. You can read the text, glance at the photo and feel like you've seen that unfamiliar animal before. Read the habitat and natural history portion and you receive a good portion of what the book is all about . . . "To aid the reader in identifying mammals."

*Mammals* begins with a section titled, "The Region." The states covered in the book encompass 85 percent of the mammal species of eastern United States. It was a thoughtful effort to describe to the reader the variety of habitats within the disciplines of the book. These are broad "macrohabitats" like mountain, piedmont and coastal plain. Large enough to classify the

region but individual enough to separate sections of the state.

The contents include; Characteristics and Adaptations of Mammals, Observations and Study, Conservation, Order Marsupialia (Insectivora, Rodentia . . .), finally a glossary and index.

This fine and reasonably priced book, is worth taking a look at. For animals that are familiar or for getting some background on a rarity (I first used it for the golden mouse), *Mammals* will come in handy. You'll enjoy *Mammals*. □

## May Fever

*In May, most animals are on the move, breeding, nesting and foraging. Here's a sample of what's movin' in May:*

- Speckled trout move into the Bay
- Stripers begin their spawning run
- Smallmouth bass and sunfish spawn
- Rails, quail, turkeys, piping plovers begin nesting
- Shorebird migration peaks on the coast
- Little grass frogs, Fowler's toads, and gray treefrogs begin to breed
- Bullfrogs and green frogs begin to call
- Spadefoot toad emerges and forages
- Beaver kits are born

## It's Not Too Late

The tax season is over for the 1986 year. Most Virginians have already filed for the year. Of the 2.4 million Virginians filing, about 57,000 will have checked off part of their refund for nongame wildlife on line 20A of the state tax form.

Their contribution will be put to good use over the next year. We will continue efforts to reintroduce the endangered peregrine falcon into the mountains of Virginia. Research will continue on the northern flying squirrel and endangered mussels. Sea turtles swimming into the Chesapeake Bay in June will continue to be monitored until they leave this fall. Vital research and recovery programs for Virginia's wildlife as well as public awareness programs are funded by the Nongame Wildlife and Endangered Species check-off.

If you were not entitled to a refund or missed line 20A on your tax form, it is not too late to be part of the growing number of Virginians who care about our wildlife. You can still help the eagles, peregrines, squirrels and other species that need our help. Contributions can be sent directly to the Game Commission. Those who contribute directly as well as those that contribute on their tax form can use the donation as a deduction next year on both their state and federal taxes. To make a contribution, or for more information write: Nongame Program, Virginia Game Commission, P.O. Box 11104, Richmond, Virginia 23230-1104. □

"Garden for Wildlife" campaign.

The National Wildlife Federation's "Gardening with Wildlife Kit," which contains a 64-page book, *Plant An Oasis for Wildlife*, sample landscape plans and planning tools, guides to

attracting and indentifying birds, and a Wildlife Gardener's Journal is available for \$16.95. For more information, call or write to: National Wildlife Federation, 1412 16th Street, N.W., Washington, D.C. 20036; (703) 790-4000 □



## Garden for Wildlife

Interest in planning wildlife habitat is not limited to homeowners. Public, corporate and recreational building projects are responding to this growing trend and many are now incorporating habitat landscape into their facilities. Even land developers are getting into the act.

On a recent trip to Tucson, Arizona, it was discovered that land developers and condominium building contractors were using habitat landscaping to help increase property values and attract buyers as well as wildlife.

To meet the increasing demand for information on how to landscape for wildlife, the National Wildlife Federation and the Planting Council of Bedford, Massachusetts have developed a

## Watch Out For Their Nests!

The piping plover has just been added to the federal endangered and threatened species list. Recent surveys indicate that there are now less than 100 breeding pairs in Virginia, with less than 500 pairs along the entire Atlantic Coast.

Plovers are extremely sensitive to disturbance during the nesting season from April to July. In Virginia, this small, pale shorebird nests on high shelly beaches, and disturbance from human activity is the leading cause of nest loss and abandonment. Beachgoers unknowingly cause the adults to leave their nests, leaving the eggs exposed to predators.

The Virginia Commission of Game and Inland Fisheries has launched a conservation program to help this species survive its critical nesting season on our coasts. Critical nesting areas will be posted and we ask that you obey these protective signs. Remember that *your* behavior will affect the survival of this species.



# Bird of the Month

## The Barn Swallow

The barn swallow is among that select group of birds that has actually benefited by the coming of the white man to North America. Although it originally ranged across the continent, its distribution was limited by its nesting requirements. The birds were dependent upon natural caves, and cliffside ledges.

In the East, with its dense cover of deciduous forest, there were few suitable sites, and the plains and prairies had little to offer them. Nor did the sandy shores of the coasts furnish them much shelter. There were, of course, no barns, bridges, piers or vacation cottages which today provide these swallows with a wide choice of nesting sites. It was only when homesteads began to appear in the wilderness, when farms were scattered over the prairies, and summer homes were built along the shores, that the barn swallow prospered.

The birds were quick to take advantage of the nesting sites offered them by the man-made structures. The early New England barns, with wide open doors and spacious lofts seemed made just for the swallows. And, as civilization advanced, the birds adapted to sheds, wharves, boathouses, bridges and culverts.

This transition from natural habitat to almost complete dependence upon man has been a happy one, for both birds and man. The barn swallow's gentle, confiding disposition combines with its special grace and beauty to make it a favorite of all who know it.

Raising their young at our very doorsteps and delighting us with their cheerful chatter, the swallows are ever our pleasant companions. Social and affectionate in their intercourse with each other, devoted and faithful in their family duties, these birds seem without fault. Moreover, the number of troublesome and noxious insects they consume is beyond estimation.

Or do we appreciate more their grace and beauty of motion? Watch them as they dance and dart about in dizzy patterns, dipping, diving, vaulting at the sky. Back again, in and out

again, up and down, then away-all with effortless speed and poise.

Thus, understandably, the first barn swallows of the spring are a welcome sight indeed. Journeying all the way from their winter home in South America, they arrive in these parts (the mid-Atlantic states) in early April. Immediately upon arrival, they inspect previous nest sites, perching nearby and uttering their pleasant, twittering song. Obvious is the joy they feel upon returning home.

Both sexes seem to arrive at the same time. There is no need for the male to arrive first to establish a territory, as is the case with some species. With barn swallows there seems not to be the conflict over space that prevails among most songbirds. They range far in the search for food, snatching it in flight, so there is no need to defend a particular piece of real estate.

Both the male and female help in the construction of the nest. The nests are layers of mud, gathered in tiny pellets, and strengthened with grasses, roots and other bits of vegetation.

Construction time varies, depending on the supply of soft, damp earth or mud. Usually this is procured from a stream or lakeshore, or from roadside puddles. When there is not a ready supply of mud, the birds resort to the repair of old nests.

The size and shape of the nest corresponds with the location: on a flat surface, it is usually circular, while those placed against a vertical wall are more cone-shaped. Nests placed in corners or niches are molded to fit the

space. Most measure about three inches across the top.

In this structure, the female eventually lays four or five eggs that are white with brownish-red and darker brown markings. Careful study reveals an under layer of soft grayish-blue spots. Both parents share the duties of incubation, relieving each other at frequent intervals, for about a two week period.

After hatching occurs, the adult birds continue to work in devoted harmony, feeding and caring for the young, which remain in the nest for a little over two weeks.

When it's time for the young to leave the nest, the parents entice them by flying back and forth in front of the nest carrying food. Even after the young have taken their first flight, they return to the nest, spending the first three or four nights back home.

Soon after the young are strong on the wing, swallows collect in flocks, preparatory to the long flight south. By late July or August, these gatherings may number several hundred birds. Most have left our area by September, though stragglers are often seen in the company of the tree swallows which move through a month or so later.

With a cruising speed of close to 40 miles per hour, they are soon well on their way to their winter resorts in South America. Many of them fly directly across the Gulf of Mexico; others travel by way of Central America and the Mexican mainland, keeping pretty well to the coastlines.

We wish them a safe journey.

by John W. Taylor

